

THE INDIAN MUGGER, *CROCODYLUS PALUSTRIS*
LESSON (REPTILIA, CROCODILIA):
OBSERVATIONS ON THE BEHAVIOUR OF A FEMALE
FROM NATURE¹

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(With six plates and a text-figure)

A female Mugger of River Mahanadi entered captivity at Tikerpada on January 31, 1979 to mate with captive males. On August 4, 1980 she broke through the wire-mesh wall of the enclosure facing the river and returned back to the river. During captivity her behaviour developed to be like other captive muggers with respect to accepting food and relationship with keepers. Feeding was below normal to that of other muggers. Scaleless fishes were preferred. Since she did not lay any eggs during two breeding seasons she spent in captivity it is suspected that she had developed temporary sterility in the prolonged absence of a male in nature. A series of courtship behaviour, twice 'initiated' by presence of a trespassing recessive male, were observed outside and in the water. Males were sexually active throughout the year but the female appeared receptive only during the winter. Orientation towards river was very strong during flood in the river flowing 50 m away; and this behaviour is believed to have caused the final return from captivity to nature.

INTRODUCTION

Earlier (Singh 1979) I reported that during December, 1977 to mid-February, 1978, corresponding with the breeding season for the species, a wild female mugger crocodile (*Crocodylus palustris*) from the Satkoshia Gorge Sanctuary (River Mahanadi, Orissa) showed strong sexual attraction towards 2 years and 10 months old (1.3-1.8 m length) male muggers reared in captivity at the Gharial Research and Conservation Unit, Tikerpada (GRACU). She was believed to be directed by olfactory clues to chemical secretions from the males,

and perhaps also by the night time activities of the males, which included noisy fights.

The present paper records subsequent observations on the mugger, namely her capture, behaviour related to social interactions, feeding, sexual activities and water orientation, and her voluntary return to the wild after eighteen months in captivity at GRACU.

PRE-CAPTURE MOVEMENT

During 1978-floods (13.72 m above summer level in the Gorge) her appearance close to the mugger enclosure was evident from her faecal pellets. It is not known if she had come close to the enclosure any other time between April 1978 and December 1978 since there were no visual indications to her presence. But she was regularly sighted in the river near GRACU during November and December, 1978 and January 1979.

¹ Accepted December 1981.

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On the night of January 18, 1979 she had come near the mugger enclosure, as was evident from tracks in the following morning. The night watcher remembered that the previous night (18 Jan.) he heard splashing sounds but had not paid any particular attention to it since such instances do occur on many nights.

On 29 Jan., 1979 she had again come near the enclosure between 23.00 and 24.00 hours, during which time there was a small shower as was evident from temperature and humidity fluctuation graphs from the 24-hour recording thermohygrograph at GRACU. She had left behind tracks of her return journey while her incoming tracks were obliterated by the rain. She had defecated on the ground near the enclosure where the large male was housed. This was probably out of excitement.

THE CAPTURE

On the night of January 31, 1979 again she came near the enclosure at about 22.30 hours. The sound of splashing was heard from the pools, as before. This time the night watcher came near the enclosure until he heard hissing sounds from the wild mugger, only 2 metres away from him in a position where her head was juxt-apposed to the head of the large male behind the wire-mesh wall.

Then the entire area including the enclosure was surrounded by straw-covered bamboo-mat frames, for which arrangements were made earlier. It took about one and a half hours to assemble the staff, bring the frames and cover the area. During this time the mugger had not changed her position. A big carpet ('dari') was put over her. As usual with crocodilians, she tried to free herself from the carpet-cover by moving back, as the carpet did not completely cover the tail. When she

had freed herself completely the carpet was again thrown over her and she was made to repeat her performance till she came close to the door into the enclosure. For the final time the carpet was so put that while freeing herself from the cover she moved into the enclosure. That was the eve of Basanta Panchami, a festival to worship Goddess Saraswati, the Goddess of knowledge and erudition. So the mugger was named 'Basanti'.

BEHAVIOUR IN CAPTIVITY

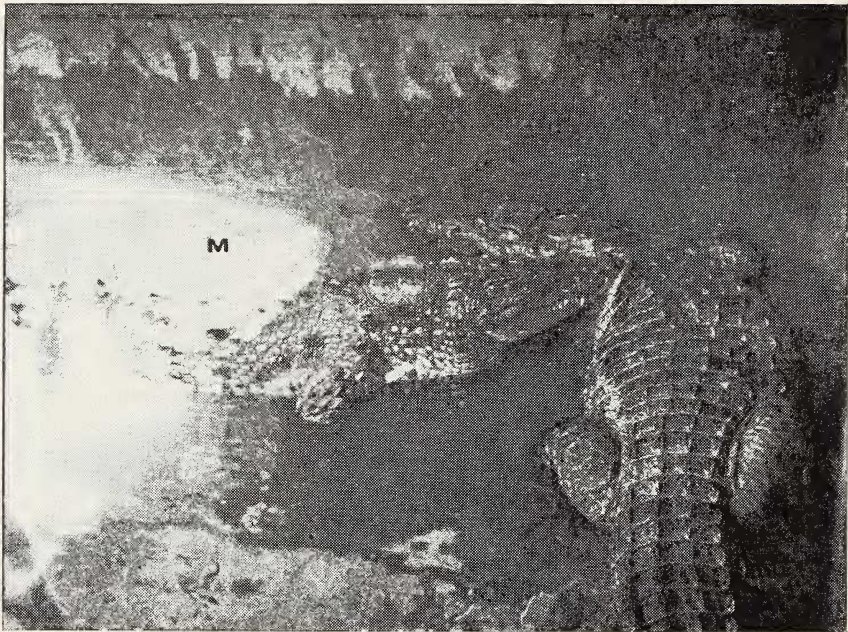
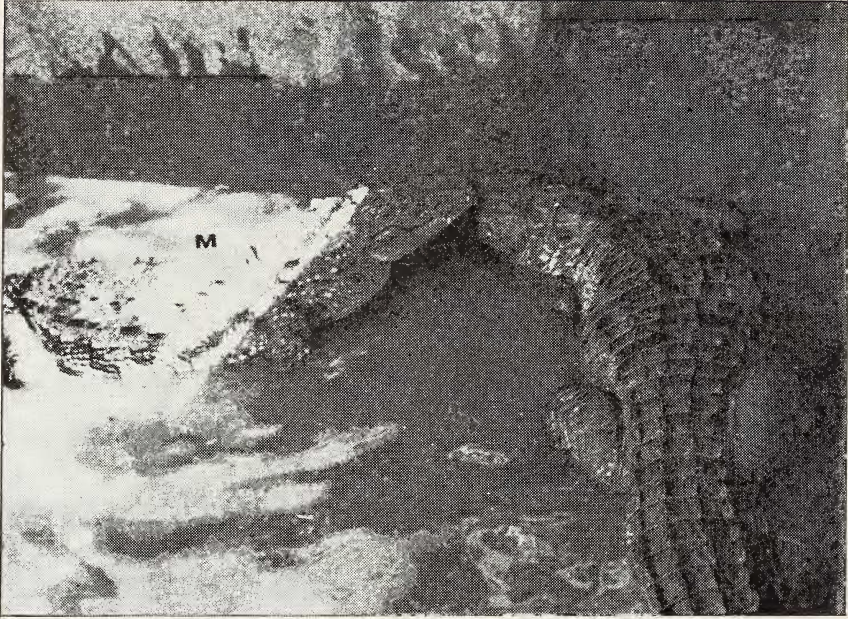
I. BEHAVIOUR TOWARDS CAPTIVE MUGGERS

The enclosure into which Basanti entered had one large pool, LP (4 x 4 x 1 m) and two small pools, SP1 and SP2 (2 x 2 x 0.3 m) set in a total area of 52 m² (Fig. 1). SP2 had the large male (M1) with whom Basanti was seen 'sexually' communicating from outside before her capture. LP had the second male M2 and three females. The body lengths of Basanti, M1, M2 and the three females were 2.35, 2.16, 2.10 and 1.5-1.8 m respectively. All pools were separated from each other by a 1.5 m high wiremesh partition standing over a 45 cm high masonry wall. As expected, the behaviour of Basanti and the resident muggers of the enclosure were extremely interesting during the first several days of Basanti's capture.

Basanti had reached SP2 by climbing over the wall. On the night of capture and the following day (Feb. 1, 1979) M1 was seen many a times in a mounted posture over Basanti. During the day, when M1 basked for a couple of hours outside water, Basanti remained in water, only 30 cm deep. On the second night she climbed over the partition between SP2 and LP and reached the bigger pool, 1 m deep, having M2 and the immature females. On the mornings of the 3rd and 4th



Courting behaviour when water is low. M is male. Snout to snout touch.
(Photo: L. A. K. Singh)



Courting behaviour when water is low. M is male.
Above: Touching the eye. *Below:* Press the back.
(Photos: L. A. K. Singh)

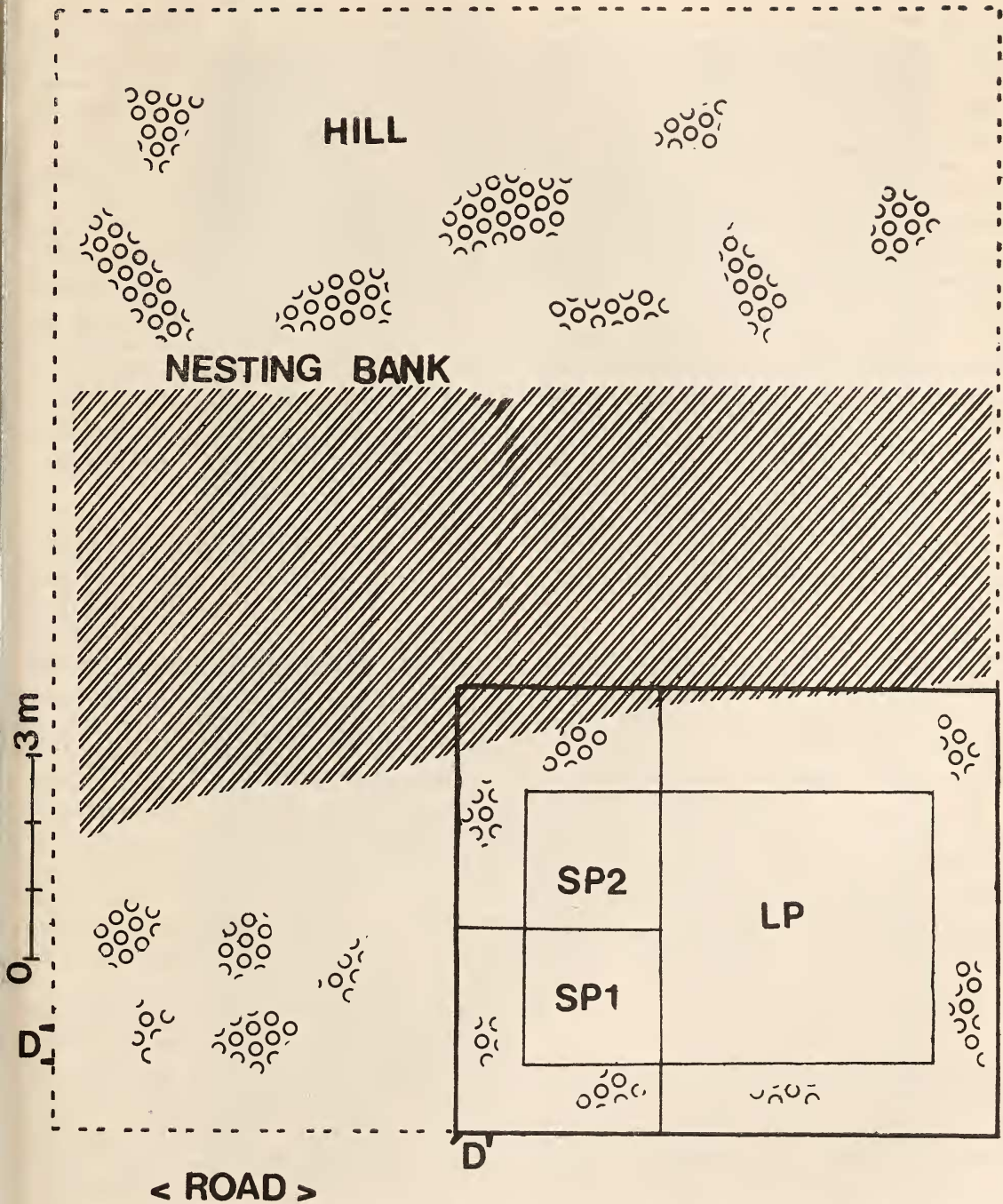


Fig. 1. The mugger enclosure at GRACU, Tikerpada. Area within solid lines: original enclosure into which Basanti entered through the door (D). SP1 and SP2: small pools; LP: large pool. Dotted line show the area extended (with open roof) over the original enclosure. Areas with circles show vegetations.

days M2 and Basanti were seen in mounted postures. Because of the depth of the pool only the head and nape, occasionally bobbing in water, were visible from outside.

On the 4th day morning (3 Feb.) the large pool was emptied for cleaning. When the water level came down the male appeared extremely sexually active and exhibited various courting behaviour (see below). During prolonged courting activities of M2, Basanti had produced low nasal hissings and vocal grunts—perhaps indications of mild objection. The expression in the eyes of the other females suggested that they were scared of M2. On a few occasions M2 had chased these females, and once he mounted one's back when the latter, with protruded eyes (an expression of anxiety) raised her head upward into air at an angle of about 45-60°—the crocodilian posture of submission. During this, other females remained alongside Basanti who did not show any objection.

During noon when water was filled, Basanti remained in water, M2 was basking outside and other females were also basking but along a different side of the pool.

The wiremesh partitions were removed on the 4th morning. By the afternoon of the 6th day (5 Feb.) the immature females had come out of LP and remained in SP1. Later, these females never changed their pools but M1 had on a few occasions gone to LP but was chased away soon by M2 (see below).

II. REACTION TO PEOPLE

Up to about one and a half months after capture, Basanti was extremely shy and often going under water when the entrance door was opened or even when someone approached the enclosure within 10-12 m. When she was watched she would surface briefly and then submerge.

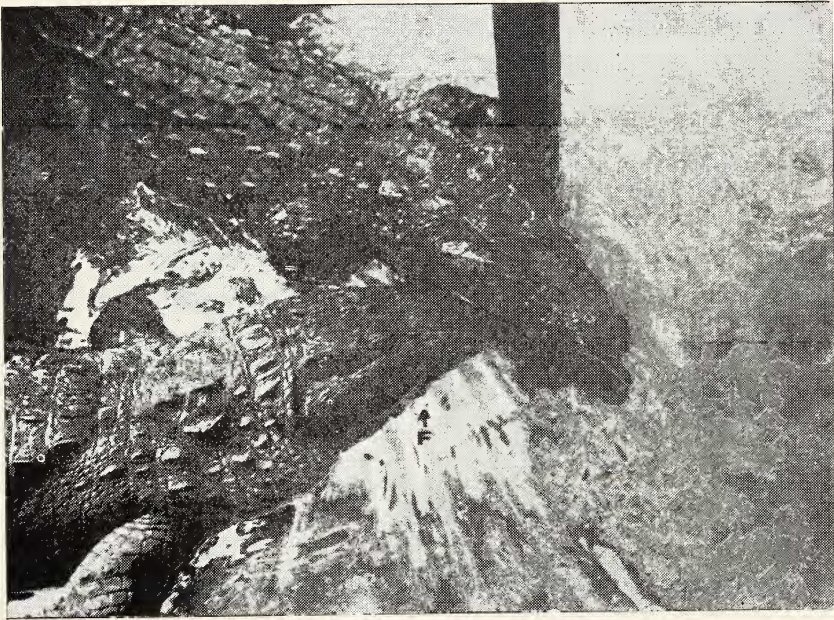
During later periods she remained on the surface even when watched. After three and a half months, when basking outside water, like other captive muggers she permitted us to approach within 45 cm from her.

Haul-out and basking: Day-time hauling out was not observed until March 10, i.e., 38 days after capture. During the period prior to this tracks suggesting night-time hauling out were noticed. This was perhaps because of the disturbance caused during the day by labourers working on the extension of the enclosure. Later, when such work stopped she basked for two to three hours every afternoon. Later when the enclosure was closed to visitors she basked during the mornings also.

III. FEEDING

Live fish of suitable size were released into the pool for Basanti and the male in the pool was 'hand-fed' as usual. Until about the third month after capture no sign of her feeding was noticed. She appeared slimmer but her eyes indicated no sign of sickness. However, during the early part of the 3rd month at times she was seen on the surface holding dead fish between the jaws. She never swallowed these when watched. On two occasions portions of fish, which had been released alive, were seen floating on the surface. Since captive males are greedy and eat whole fishes larger than these (from which the parts were seen), it was suspected that Basanti had been extremely 'choosy'.

Later she responded to our approach with her feed, and even accepted the feed when thrown close to her mouth, but did not swallow the food on such occasions until she had been six months in captivity. Assuming that the male (M1) in the pool with Basanti was eating its normal quantity of food, Basanti's feeding rate was determined from the quantity of food provided in the pool and/or

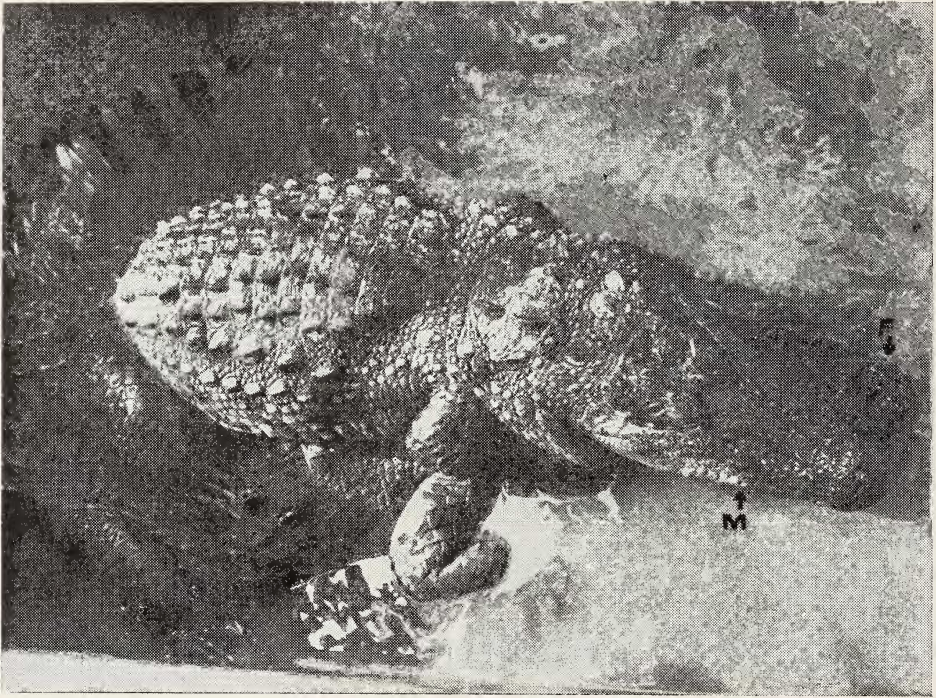


Courting behaviour when water is low. F is female (Basanti).

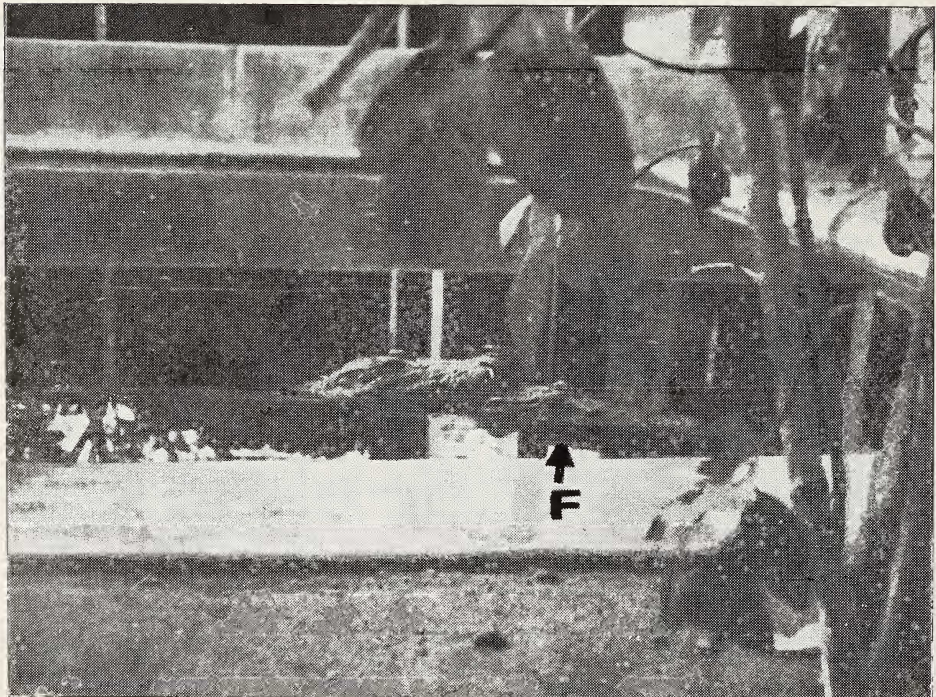
Above: Side to side touch of the head.

Below: Male keeping the everted neck glands over the nostril of the female.

(Photos: L. A. K. Singh)



Mounting as an attempt to mate. (But prevented because of low water).
M — male; F — female.



Courting behaviour in water. F — female. Early postures during mounting.
(Photos: L. A. K. Singh)